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Current Trends

Update: Influenza Activity — United States and Worldwide, and Composition of the 1993–94 Influenza Vaccine

In collaboration with the World Health Organization (WHO) international collaborating laboratories and with state and local health departments in the United States, CDC conducts surveillance to monitor influenza activity and to detect antigenic changes in the circulating strains of influenza viruses. This report summarizes surveillance for influenza in the United States and worldwide during the 1992–93 season and describes the composition of the 1993–94 influenza vaccine.

United States

During the 1992–93 influenza season, influenza activity in the United States began in October and increased gradually from December through late February. Recent reports suggest that activity may be declining in some areas. The number of isolates and the ratio of specimens positive for influenza to total specimens submitted for respiratory virus testing declined slightly during late February and early March. Weekly reports by state and territorial epidemiologists indicated increasing levels of influenza-like illness (ILI) from December through late February and a slight decline from late February through early March.

From October through January, influenza B viruses predominated and outbreaks were reported primarily among school-aged persons; outbreak activity reported among older adults was limited, and no excess occurred in influenza-associated mortality. Recent increased circulation of influenza A(H3N2) viruses has been associated with reports of increasing numbers of culture-confirmed outbreaks in nursing homes and other chronic-care facilities.

From September 27, 1992, through March 6, 1993, 1791 (86%) of the 2087 influenza virus isolates reported by the WHO collaborating laboratories in the United States were influenza type B. Influenza B viruses isolated in the United States this season have been antigenically similar to the B/Panama/45/90 virus included in the 1992–93 influenza vaccine. However, the proportion of influenza type A viruses has steadily increased since mid-January. From September 27, 1992, through January 16, 1993, 10 (2%) of the 578 influenza viruses reported were influenza type A compared with 144 (14%) of the 1026 viruses reported for January 17 through February 13 and

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available to local and state health departments to ensure adequate and timely health care.

References

1. Glass RI, Nieburg P, Cates W Jr, et al. Rapid assessment of health status and preventive-medicine needs of newly arrived Kampuchean refugees—Sakaeo, Thailand. Lancet 1980; 1:868–72.
2. CDC. Health status of Kampuchean refugees—Khao I-Dang. MMWR 1979;28:569–70.
3. Guerrero IC, Chin W, Collins WE. A survey of malaria in Indochinese refugees arriving in the United States, 1980. Am J Trop Med Hyg 1982;31:897–901.
4. Maldonado YA, Nahlen BL, Roberto RR, et al. Transmission of *Plasmodium vivax* malaria in San Diego County, California, 1986. Am J Trop Med Hyg 1990;42:3–9.
5. Lederberg J, Shope RE, Oaks SC, eds. Institute of Medicine. Emerging infections: microbial threats to health in the U.S. Washington, DC: National Academy Press, 1992:137.

Current Trends

Inability of Retroviral Tests to Identify Persons with Chronic Fatigue Syndrome, 1992

Chronic fatigue syndrome (CFS) is characterized by prolonged, debilitating fatigue (*1*). Although the cause of CFS unknown, CDC and researchers in other organizations have been investigating whether infection with a previously unidentified retrovirus might be an etiologic factor. Based on reports suggesting that retroviral infection with a human T-lymphotropic virus type 2 (HTLV-II)-like retrovirus or a spumavirus might be associated with CFS (*2,3*), some research and commercial laboratories developed assays to test specimens from persons with CFS. Even though the hypothesized association between infection with retroviruses and CFS has not been confirmed, these tests are used commonly to evaluate patients with CFS. This report summarizes the findings of a controlled, blinded study conducted in 1992 to determine whether three retroviral tests can distinguish serologically between patients with CFS (i.e., case-patients) and healthy controls.

Blood samples were obtained from 68 case-patients from four study populations (northern New Jersey [n=29 and n=14]; Charlotte, North Carolina [n=10]; and Lyndonville, New York [n=15 adolescents aged 11–21 years]*) whose illnesses met the published case definition for CFS (*1*). For each of the 68 CFS case-patients, one healthy convenience control was selected from the same geographic area and matched for age, sex, and race.† Specimens were assigned random code numbers so those from case-patients could not be distinguished from those of controls.

Blood samples from case-patients and controls were sent to two laboratories that had developed retroviral tests based on previous reports (*2,3*). Laboratory A performed testing with an original polymerase chain reaction (PCR) assay and a modification of the same assay (developed using the methodology that revealed nucleic acid sequences suggestive of an HTLV-II-like retrovirus). Laboratory B performed testing by culturing lymphocytes to identify the foamy cell cytopathic effect that is

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*Case-patients from the other three study populations were aged 18–62 years (median age for all study populations combined: 37.5 years).
†Case-patients were matched because CFS occurs primarily among white women (average age at onset: 30.2 years) (*4*).

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characteristic of a spumavirus. For the 29 case-patients and controls from New Jersey, samples were sent to laboratory A only; samples from all other case-patients and controls were sent to both laboratories A and B.

Previous retroviral tests performed at laboratory A (using their original PCR assay) were positive for all CFS case-patients from New Jersey. Other previous retroviral tests (performed at the research laboratory that reported finding an association between retroviral infection and CFS [*2*]) were positive for the 15 case-patients from New York. Of the 10 case-patients from North Carolina, six had been tested previously for retroviral infection; of these, four were positive.

None of the three assays could differentiate between case-patients and controls in either the combined study population or any of the individual study populations (Table 1). Both the original PCR assay from laboratory A and the cell-culture assay from laboratory B were positive for 59% and nearly 50%, respectively, of the case-patients and controls. The modified assay from laboratory A was negative for nearly all the case-patients (90%) and controls (96%).

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Editorial Note: CFS has emerged as an important social and public health issue in the United States (*3*). Many of the complexities associated with this issue relate to diagnosis and reflect the inability of investigators to identify pathognomonic findings for CFS. In particular, CFS is primarily diagnosed by identifying specific symptoms reported by the patient and by excluding other potential causes of prolonged fatigue (*3*).

TABLE 1. Results of retroviral testing of chronic fatigue syndrome case-patients and controls — four study populations, 1992

		% Positive, by assay		
		Laboratory A		Laboratory B
Study population	Sample size	Polymerase chain reaction, original	Polymerase chain reaction, modified	Culture for foamy cell cytopathic effect
New Jersey				
Cases	29	52%	0	*
Controls	29	59%	0	*
New Jersey				
Cases	14	57%	0	50%
Controls	14	71%	0	43%
New York				
Cases	15	60%	6%	40%
Controls	15	53%	6%	60%
North Carolina				
Cases	10	80%	10%	50%
Controls	10	50%	0	40%
Total population				
Cases	**68**	**59%**	**3%**	**46%†**
Controls	**68**	**59%**	**1%**	**49%†**

*Not tested; these specimens were not sent to laboratory B.
†n=39.

Chronic Fatigue Syndrome — Continued

In April 1991, researchers reported finding nucleic acid sequences suggesting the presence of an HTLV-II-like retrovirus in lymphocytes of persons with CFS but not in healthy controls (*2*). Evidence suggesting the presence of a spumavirus—a retrovirus subfamily—in specimens from CFS patients also was reported in 1991 (*3*). These and other reports suggesting that retroviral infection might be associated with CFS have prompted investigations by institutions and have resulted in the use of retroviral testing to evaluate patients for CFS. Despite these efforts, the suggested association of retroviral infection with CFS has not been confirmed.

The study described in this report is the first controlled, blinded trial to examine the ability of these retroviral tests (i.e., PCR assay, PCR modified assay, and culture for foamy cell cytopathic effect) to distinguish CFS case-patients from controls. The findings from this study do not support the hypothesized association between infection with retroviruses and CFS and are consistent with findings from other studies assessing evidence of retroviral infection (*5–10*).

Although previously unidentified retroviral agents might be etiologic factors or cofactors for CFS, no scientific basis exists for the use of retroviral testing to confirm the diagnosis of CFS. Diagnostic testing of patients with suspected CFS should be done solely to exclude other diagnoses (*11*).

References

1. Holmes GP, Kaplan JE, Gantz NM, et al. Chronic fatigue syndrome: a working case definition. Ann Intern Med 1988;108:387–9.
2. DeFreitas E, Hilliard B, Cheney PR, et al. Retroviral sequences related to human T-lymphotrophic virus type II in patients with chronic fatigue immune dysfunction syndrome. Proc Natl Acad Sci USA 1991;88:2922–6.
3. Palca J. On the track of an elusive disease. Science 1991;254:1726–8.
4. Gunn WJ, Connell DB, Randall B. Epidemiology of chronic fatigue syndrome: the Centers for Disease Control and Prevention study. In: Bock GR, Whelan J, eds. Proceedings of the CIBA Foundation Symposium 173: chronic fatigue syndrome. Chichester, West Sussex, England: John Wiley and Sons, 1993:88-101.
5. Khan AS, Heneine WM, Chapman LE, et al. Assessment of a retrovirus sequence and other possible risk factors for the chronic fatigue syndrome in adults. Ann Intern Med 1993;118:241–5.
6. Folks T, Heneine W, Khan A, Woods T, Chapman L, Schonberger L. Investigation of retroviral involvement in chronic fatigue syndrome. In: Bock GR, Whelan J, eds. Proceedings of the CIBA Foundation Symposium 173: chronic fatigue syndrome. Chichester, West Sussex, England: John Wiley and Sons, 1993:160–75.
7. Heneine W, Woods TC, Sinha HD, et al. Absence of evidence for infection with known human and animal retroviruses in patients with chronic fatigue syndrome. Clin Infect Dis (in press).
8. Gow JW, Simpson K, Rethwilm A, et al. Search for retrovirus in the chronic fatigue syndrome. J Clin Pathol 1992;45:11–14.
9. Landy AL, Jessop C, Lennette ET, Levy JA. Chronic fatigue syndrome: clinical condition associated with immune activation. Lancet 1991;338:707–12.
10. Schluederberg A, Straus SE, Peterson P, et al. Chronic fatigue syndrome research: definition and medical outcome assessment. Ann Intern Med 1992;117:325–31.
11. Schluederberg A, Straus S, Peterson P, et al. Chronic fatigue syndrome research. Ann Intern Med 1992;117:325–31.